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AUTHOR Looft, William R.
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ABSTRACT

Sixty-three children ranging in age from three to nine years made age judgments on drawings of human figures. The stimuli consisted of four different male figures drawn according to typical physical characteristics of the middle-aged adult, adolescent, child, and infant. The figures were reproduced in two sizes and were presented to the subjects in a paired comparison procedure. Children's accuracy in determining the older of the two figures on each stimulus card increased steadily over the seven age levels. The errors of young subjects were primarily due to a figural-size response set. Older children made increasing use of other physical features in making their judgments. (Author/WY)

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CHILDREN'S JUDGMENTS OF AGE[1]

William R. Looft
Department of Educational Psychology
The University of Wisconsin

An observant parent will notice several aspects of the qualities of a child's thinking as the child attempts to make sense of his world. The sensitive adult soon discovers that the phenomenological world of the child is likely to be quite different from that of the adult. An example can be found in the child's judgments regarding the age of other people. From incidental observation it appears that sometime during the first two or three years of life the child becomes aware that there is a correlation between people's age and their physical size; from the egocentric perspective of the child, this is a quite reasonable hypothesis. It may be, however, that it is nearly impossible for the child to disentangle this correlation until well into the school years. Thus, the larger of two persons must of necessity be the older, and the larger one is, the older he must be.

Britton and Britton (1969) found that preschool children were generally unable to order correctly by age a series of pictures representing persons at various points across the life span. It was the intent of the present study to investigate systematically the developmental progression of children's perceptions of age from a "younger-older" framework. It was hypothesized that physical size is the salient determinant in very young children's judgments, and that older children's age judgments are modified by the consideration of additional relevant physical factors. More specifically, it was hypothesized that there is an increasing linear trend in the accuracy of children's age judgments, and that there is a

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decreasing linear trend in children's judgments based on the single factor of size; it was recognized, however, that nonlinear functions for these two variables may also exist.

Method

Subjects

The subjects were children aged three through nine years (3:0 to 3:11, 4:0 to 4:11, etc.) who were enrolled in the Child Development Laboratory, which is operated by Iowa State University for the use of students in teacher training programs. In general these children were considerably above average in intelligence. Nine subjects from each age level were tested (N=63), with about equal numbers of boys and girls at each level.

Stimuli

The drawings employed in this study, shown in Figure 1, represented males at four levels of the life span: infant, child, adolescent, adult. Only one sex was used in order to avoid confusion over differential perceptions of that variable as it relates to age. The figures were drawn with only towels draped around their waists to allow the observation of relevant physical cues. The drawings were photographically reproduced in two sizes, 3 1/2 inches high and 5 1/2 inches high (of course, all dimensions were expanded proportionately). Thus there were eight different figures in all (four ages, two sizes), and these were paired into 28 different combinations. All possible pairs were formed with the exception of the same figure at the same size. Each of the picture pairs were mounted on 9-inch by 12-inch cards. The placement of the drawings on the cards (left-right, older-younger) was randomized.

Insert Figure 1 about here

Procedure

The children were tested individually by an examiner in a small room. The subject was first allowed to glance quickly through the stack of stimulus cards in order to become acquainted with the drawings. He was then instructed that he would be shown one card at a time, and that he was to decide which of the two figures on each card was the "older person," or whether they were both of the same age. Both telling and pointing were allowed for the child's responses. Periodically the subject was asked to explain the particular answer he gave for a card. The order of presentation of the 28 cards was randomized for each subject.

Measures

The two dependent measures were accuracy (the total number of correct responses given by each subject) and the number of size responses (that is, the choice of the larger figure in a pair when that figure represented an incorrect judgment). Thus, the maximum accuracy score was 28; the maximum size score was 10, for this measure concerned only certain of those pairs in which the figures were presented in different sizes (six of these cards had different figures presented at different sizes, and the other four contained the same figure presented at different sizes). The size measure was only an error score; it did not include those cards in which the older figure was presented as the larger figure. Thus, there existed a reciprocal relationship between the two measures: A maximum accuracy score of 28 also determined a zero score on the size measure, and vice versa.

Results and Discussion

The results of the analyses of variance are summarized in Table 1. As can be seen from the table, the multivariate test for linearity was highly significant, while the multivariate tests for quadradicity and for other higher order polynomial functions were nonsignificant. The univariate tests for the two dependent measures, accuracy and size, also indicated highly significant linear trends. The test for a quadratic trend for the size variable approached significance ($p < .05$).

Insert Table 1 about here

Table 2 summarizes the mean performance for each of the seven age levels. With the exception of the 4:0-4:11 group, it can be seen from the table that there existed an orderly developmental progression in making correct age judgments. In terms of percentage, accuracy improved fairly steadily from a low of 40 percent at age three to 81 percent at age nine. It should be noted that the first subject to provide correct responses to all 28 pairs was found at age seven. The nine-year-old group contained two perfect responders and three more who missed only one or two judgments. (It should be pointed out that random responding would result in a score around 50 percent correct; however, if a child answered in accordance with a figural size set, then his accuracy score would be significantly lower than 50 percent.).

Also in Table 2 can be seen the change with age in providing size responses, i.e., choosing the larger of two figures to be the older when in fact this was not the case. For example, in the pair consisting of a

small Adolescent and a large Infant, the subject judged the Infant to be the older. Another possibility would have involved a card containing the same figure drawn at two sizes; if the subject indicated the large Adult, for example, to be older than the small Adult, then it was apparent he was making his decisions on the basis of size. The correct response would have been a recognition that they were the same figure, thus the same age, but were merely presented at two different sizes. Although care was taken not to force subjects to judge one of the two figures on each card as being the older, it is of interest that all subjects in the lowest two age groups perceived one of the two figures as older in all cases, including the four cards containing the same figures. In Table 2 it can be seen that the four-year-olds responded almost completely to the size dimension in these pairs. At age five, two children gave a few "same age" responses, but these were all inappropriate (i.e., the cards in question contained different figures). Not until age seven did there appear correct responses for the cards containing same-figured pairs, and even these were provided by only three subjects. At age nine, seven of the nine subjects correctly verbalized that these cards contained figures representing the same age.

Insert Table 2 about here

Figure 2 pertains to the 12 pairs in which the drawings all appeared at the same size. Thus, these cards included a small Adolescent paired with a small Adult, a large Child with a large Infant, and so on. For these pairs, for which age judgments of necessity had to be based upon information other than illustrated size, accuracy improved steadily with

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increasing age.

Insert Figure 2 about here

Spontaneous verbalizations, as well as the elicited explanations, gave clues regarding the children's logic in making their judgments. Representative explanations given by subjects aged three through six were these: "He's taller"; "He has to be big to be older"; "He's bigger." Of particular interest was the response of one boy (age 6:0), when asked why he had picked the Child figure to be older than the Adult figure (both were presented at the same size). The boy re-examined the pair a bit perplexedly for a short time, and then he exclaimed, "Cause he's bigger...Look!" And then he proceeded to move his finger from the top of the Adult's head over to the top of the Child's head, making an exaggerated slanting line in doing so.

In Piaget's (1950) theoretical framework for intellectual development, children in the general age range from two to seven years are considered to be "preoperational." The preoperational child, according to Piaget, tends to be dominated by his perceptions; he focuses his attention on a single attribute of a display, and his reasoning follows a transductive, or part-to-part, form of logic. This framework seems appropriate for accounting for the judgments of the young children in the present study. Indeed, these subjects seemed to perseverate on one attribute, that of size. They appeared to be so overwhelmed by this perceptual feature of the drawings that all other visual cues were rendered insignificant. In Church's (1961) phraseology, the perception of these children was physiognomic,

i.e., they seemed to be operating according to a level of perception that was basically organismic and unmediated and which was inattentive to several isolable perceptual dimensions.

The eight- and nine-year olds, however, were entering a period in which more operational forms of thought begin to predominate. These children gave evidence of understanding that an object can change in one respect without changing in other respects; they seemed to recognize that a number of physical attributes enter into the concept of age, and therefore they began to take notice of such characteristics as hair, chest size, and body proportions. In Church's (1961) terms, they displayed contemplative perception. Thus it appears that at about this period of life the child enters a transitional period during which, among other changes, the age-size correlation begins to be disentangled.

References

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Footnote

[1]An abbreviated version of this paper was presented at the meetings of the American Educational Research Association, Minneapolis, March, 1970. The author wishes to express appreciation to those persons who provided assistance in the conduct of this study: Don C. Charles, T. Anne Cleary, David C. Edwards, Kathryn Fuger, Barbara Gundelach, Daniel M. McMillen, and James E. Patton. Author's address: Department of Educational Psychology, The University of Wisconsin, 432 North Murray Street, Madison, Wisconsin 53706

Table 1

Multivariate and Univariate Analyses of Variance

Test		F Ratio	p
A. Linearity			
Multivariate test		22.08	<.0001
Univariate tests:	Accuracy	44.26	<.0001
	Size	18.71	<.0001
B. Quadradicity			
Multivariate test		1.89	<.16
Univariate tests:	Accuracy	1.05	>.25
	Size	3.86	<.05
C. Higher Order Polynomial Functions			
Multivariate test		.88	>.25
Univariate tests:	Accuracy	.53	>.25
	Size	.69	>.25

Table 2

Summary of Children's Age Judgments and Size Responses

Age Level	Dependent Measures	
	Mean Number Correct Age Judgments[a]	Mean Number Size Responses[b]
3:0 - 3:11	11.4	6.7
4:0 - 4:11	12.7	9.2
5:0 - 5:11	11.8	7.2
6:0 - 6:11	16.1	7.1
7:0 - 7:11	18.4	5.1
8:0 - 8:11	20.6	3.8
9:0 - 9:11	22.6	2.3

[a]Maximum possible score = 28.

[b]Total possible size responses = 10.

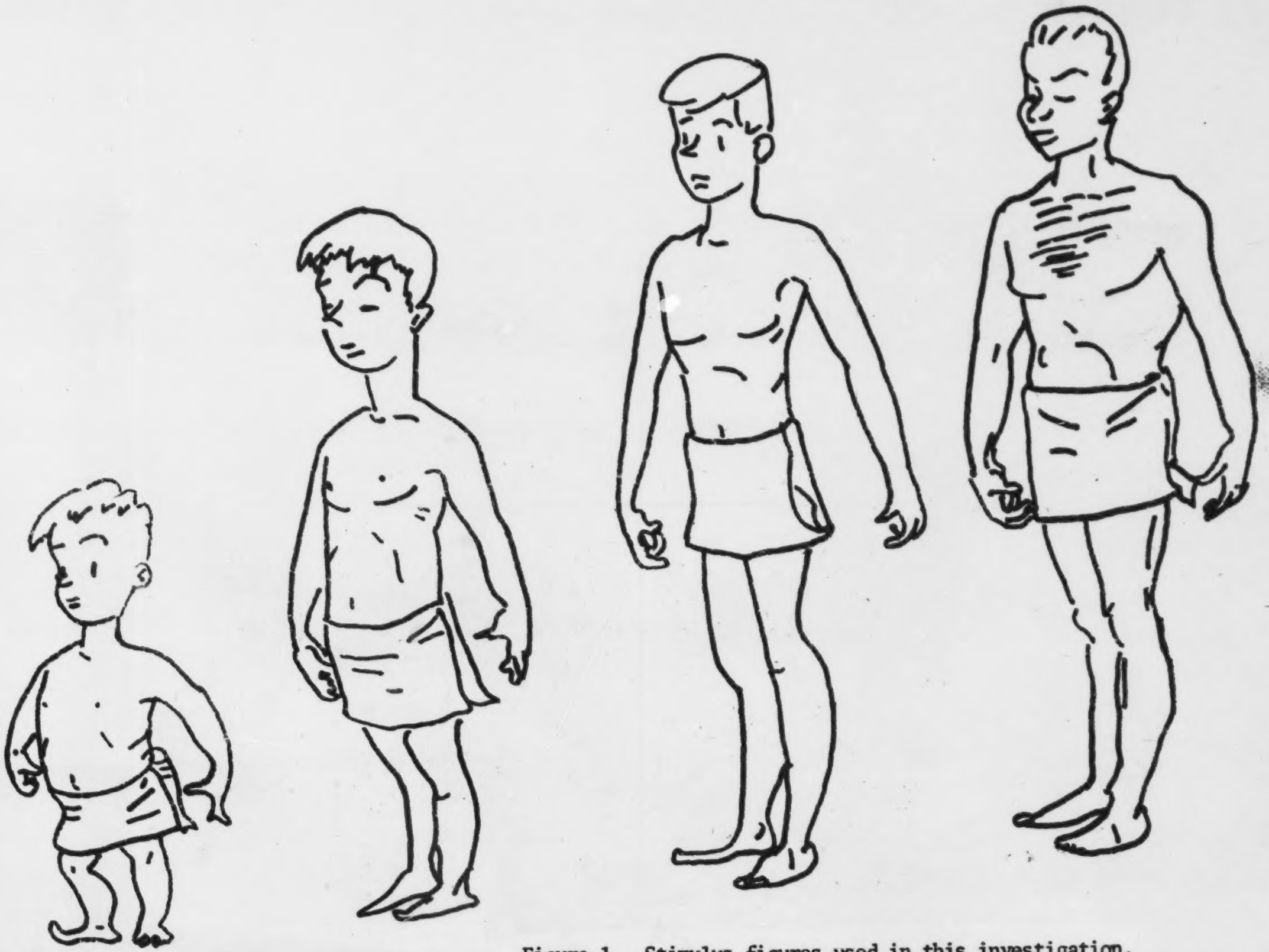

Figure 1. Stimulus figures used in this investigation.

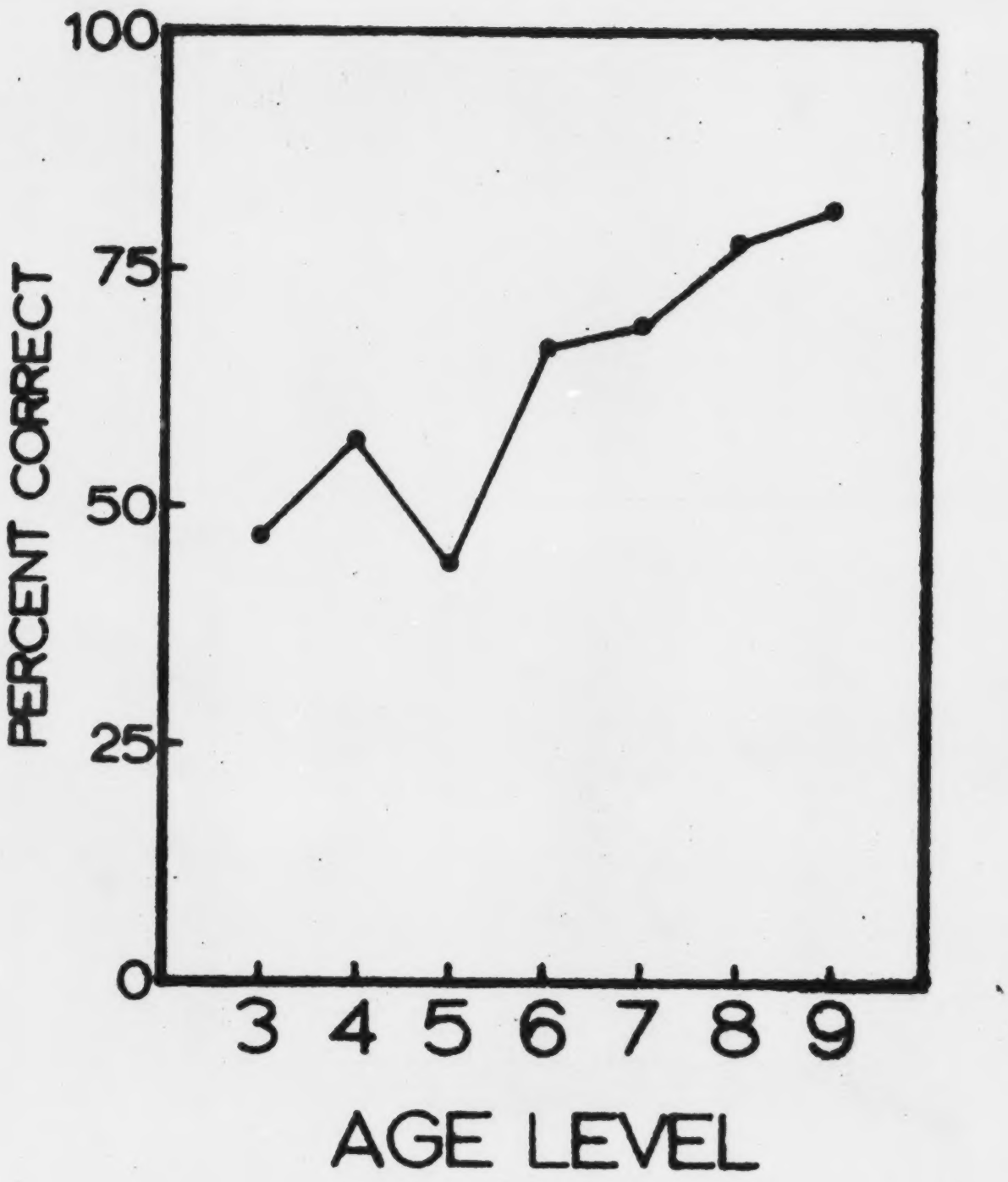

Figure 2. Percentage of correct responses in pairs containing figures of identical size.